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Global Executive Information Systems (GEIS): Role of Users and GEIS Architecture

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Abstract

This paper reports the partial results of a study conducted to explore the design, development, use, management and structure of global executive information systems (GEIS). The results reported in this paper discuss the following characteristics of a GEIS: the scope of a GEIS, potential users of a GEIS, the involvement of the users in the initiation, sponsorship, and development of a GEIS, the impact of using a GEIS on the work of executives, and the architecture of a GEIS. The study was conducted in three phases.

Introduction

Recent changes in the business environment have led to the creation of a global economy. The establishment of a single European market; *perestroika* and the breaking up of communism in Soviet Union and eastern Europe; the North American free-trade zone consisting of the United States, Canada, and Mexico (NAFTA); and future trading blocs in the Pacific Basin between countries such as Japan, South Korea, Taiwan, Singapore, Thailand, Indonesia, and Malaysia are some of the factors that have facilitated the process of globalization. As a result of these changes it is important that executives have access to relevant international information to assist them in their decision-making function. Executive information systems, developed in the 1980s fail to provide support for executives working in the international domain. In this study we attempt to explore some of the characteristics of systems developed for executives of global organizations. We call such a system as a global executive information system (GEIS) and define it as:

- a computer-based information system
- that provides easy access to internal and external information (both domestic and international)
- for senior executives working at headquarters and in subsidiaries worldwide of a global organization
- to support their analysis and decision-making functions.

Such a system would allow executives in global organizations to access data on markets worldwide. This will enable them to exploit opportunities, which will help the organization to achieve competitive advantages in different markets. Before a GEIS can be developed and potential benefits are derived, several problems need to be addressed. In this study, an attempt was made to explore the following research question:

What are the key issues in the design, development, structure, use and management of global executive information systems?

Methodology

The GEIS research study was conducted in three phases to test the research question addressed in the first section. The three phases conducted for the study were: phase I: literature review and analysis, phase II: pilot case studies, and phase III: a pilot and the final mail survey. Phase I of the research study was an extensive literature review of the following streams of research: globalization and the role of information technology in global organizations, executive information systems, and global executive information systems.

Phase II of the research study used the case study approach to refine and extend the issues that were identified during the literature review. The objective of this phase was to use the case studies as a pilot to formulate specific research propositions and questions for the study.

Phase III of the research study used a mail survey to get responses. The objective of this phase was to verify the initial findings developed during phase I and II. A multi-part questionnaire was mailed to a large random sample (503 companies) of geographically dispersed global firms in the United States. The mail questionnaire provided a definition of global executive information systems in the beginning to ensure that respondents have a basic understanding of the term and so that there is consistency in responses. The questionnaire was pretested by initially mailing it to 20 companies. Changes, if any, were

incorporated and the questionnaire was then mailed to the remaining companies. The survey population for the questionnaire was chosen from the *Information Week* list of the 500 biggest and best corporate users of information technology. This list was matched with databases like the *World Directory of Multinational Enterprises* and the *Fortune Industrial and Service 500's* to develop a list of global organizations. It was assumed that being the leaders of the usage of information technology, these companies would be potential candidates to have a GEIS or an EIS. Once the data was collected, statistical tests were used to analyze the data and report the results.

Results

Demographics: Main Study:

The respondents for this study included global companies headquartered in different parts of the United States and the world. Of the total usable responses ($N = 47$, approximately 9%), 85.7% of the companies had their headquarters in the United States and the remaining 14.3% had their headquarters in other countries of the world. The number of manufacturing sector companies was 23 (approx. 49%) and the number of service sector companies was 24 (51% approximately).

Fifty-seven percent of the companies ($N = 47$) responded in the positive when asked if they had an EIS being used in their companies. Twenty-eight percent of the companies ($N = 47$) responded that they use a global EIS for their senior executives. Only six of these companies answered about the scope of the system that was being used in these companies. In all six cases the global EIS was being used enterprise wide or all executives in the global organization were using the system.

Scope of a GEIS:

More than three-fourths (79.2%) of the respondents were of the opinion that the scope of the global EIS should be enterprise-wide, i.e., the global organization. Very few respondents recommended the regional organization (12.5%), product division (6.3%) or the department/function (2.0%) as the scope for a global EIS.

Users of a GEIS and their role in initiation, sponsorship & development of the system:

Majority of the respondents recommended that the CEO (81.3%) and top management at headquarters (97.9%) and subsidiaries (89.6%) of a global organization should be primary users. There is not overwhelming support for including middle management at headquarters (64.6%) or in subsidiaries (60.4%) as primary users of a global EIS. This is in comparison to the results for including senior management as primary users of the system. As a global EIS is designed specifically for senior executives working in a global organization, the results are reinforcing.

When asked about the initiator of the global EIS project, two-thirds of the respondents (66.6%) agreed that business executives (at hdqrs. and subs.) rather than IS personnel should initiate the global EIS project. Respondents (83.3%) also agreed that the higher the organizational level of the initiator of the global EIS project, the better the chances of success of the project. When asked about the organizational level of the sponsors, more than two-thirds of the respondents agreed that the higher the organizational level of the executive sponsor (79.2%) and the operating sponsor (68.7%) of the global EIS project, the better the chances of success of the project. These results point out that the primary users of a GEIS (executives) should be involved actively in the initiation and sponsorship of the GEIS project to ensure successful implementation.

Impact of using the GEIS on the work of executives:

Majority of the respondents (95.8%) believe that the use of a GEIS results in an improvement in the quality of decision-making. More than two-thirds (70.8%) respondents also believe that the usage of a GEIS results in improved productivity in the decision-making process. The results clearly show that access to timely information (external and internal) leads to an improvement in the decision-making process and the quality of decisions made.

Respondents (72.9%) do not believe that the usage of a global EIS results in faster task completion for executives. The result is different from what the literature indicates (Elam & Leidner, 1995; Rainer & Watson, 1995; Watson et. al., 1993). The need for detailed analysis of information by executives may lead to more time being spent before the final decision is made. Also the fact that international information is being analyzed can impact the time that is taken for analysis. This could be a possible explanation for the respondents' viewpoint.

Architecture of a GEIS:

Majority of the respondents (91.6%) felt that the scope of the data that is included in a GEIS should be the global organization. This data is internal to the organization and would be extracted from databases that exist in the organization, e.g., transaction processing systems and functional areas (Watson et. al., 1991).

All respondents agree that data integrity (100%), data security (100%), and data standards (100%) are important issues for the management of data that is used for generating information for a GEIS. Respondents (73.0%) agree that it is important to include soft data in a GEIS and that the inclusion of such data in the GEIS will lead to a better quality system being developed. Majority of the respondents (85.5%) felt that the inclusion of a knowledge base will enhance the quality of the GEIS that is developed. This knowledge will be useful for solving complex problems in the global business environment and would also provide an explanation for some of the solutions.

In this study, a majority of the respondents (93.8%) were of the opinion that the inclusion of a model management in a GEIS is important. The respondents believe that such a component will increase the effectiveness of the system that is developed. This is a significant result as it shows a preference for analysis and modeling capabilities in a GEIS. Executives need to evaluate alternatives and conduct “what-if” and sensitivity analysis in their decision-making process.

All the respondents (100%) in this study were of the opinion that the ease of use of a GEIS is an important issue. If executives have to be trained for more than a few minutes to use the system then it will not satisfy the executives. All the respondents (100%) were of the opinion that the information should be presented to the executives in a desired format, 95.8% of the respondents recommended the use of graphics for presenting information, and 93.7% of the respondents recommended using color for presenting information to the executives. These results point out that executives should be provided information by a GEIS in different formats and the use of graphs and color is highly desirable.

In this study, 79.2% of the respondents were of the opinion that incorporating electronic mail capabilities in a GEIS is important. The electronic mail capability would allow executives to communicate with other people from anywhere at any time. This is very important in a global organization as it reduces the need to meet people from different subsidiaries from time-to-time. 60.4% of the respondents in this study were of the opinion that a “scheduler” for appointments was of importance to them. This would allow executives to keep track of their appointments, especially when they are travelling.

Conclusion

A summary of the findings of this study is as follows:

- A GEIS should be global in scope, i.e., enterprise-wide and not regional or functional or based on one product division.
- There is strong support to include the CEO, and top management at headquarters and subsidiaries as primary users of a GEIS.
- Business executives at headquarters and subsidiaries should initiate the GEIS project.
- Data integrity, security, and standards are considered to be important issues with respect to data management in a GEIS.
- Inclusion of a model management and knowledge management component in the GEIS will increase the quality of the system.
- Information should be presented in different formats (tabular, graphics, use of color etc.) for executives.
- E-mail and scheduler are desired features.
- The user-interface should be based on mouse/touch screen/menus and icons. All information should be provided on-line for executives.

Some of the limitations of this study include:

- This study is limited to U.S.-based organizations primarily.
- The responses of this study are based on propositions that were developed using perceptions. It would be interesting to study those companies, which have a GEIS.
- Expected contributions from the study include:
- This research study is perhaps the first study to address comprehensively the issues involved in the design and development of a GEIS.
- The results of this study can be used by practitioners to develop global executive information systems.
- Academics can use the results of this study to conduct future research in this area.

References

References available upon request (clementc@uwwvax.uww.edu; ppalvia@cc.memphis.edu).